

**METHOD OF WRITING TO A
MULTI-STATE MAGNETIC RANDOM ACCESS MEMORY CELL**

ABSTRACT OF THE DISCLOSURE

[0081] A method to switch a scalable magnetoresistive memory cell including the steps of providing a magnetoresistive memory device (12) having two bits (18) and (20) sandwiched between a word line (14) and a digit line (16) so that current waveforms (104) and (106) can be applied to the word and digit lines at various times to cause a magnetic field flux H_W and H_D to rotate the effective magnetic moment vectors (86) and (94) of the device (12) by approximately 180° . Each bit includes N ferromagnetic layers (32) and (34, 42) and (44, 60) and (62, 72 and 74) that are anti-ferromagnetically coupled. N can be adjusted to change the magnetic switching volume of the bit. One or both bits may be programmed by adjusting the current in the word and/or digit lines.